

WHAT IS CLAIMED IS:

1. A servo writing apparatus which records servo patterns on a disk medium incorporated in a disk drive including a head and the disk medium in which a pattern  
5 for position detection in a rotation direction is recorded, the head including a read head device and write head device, the disk drive having a constitution in which a positional relation between the read head device and write head device relatively deviates in an  
10 inner or outer peripheral direction of the disk medium, the servo writing apparatus comprising:

detection means for detecting a position of the head positioned on the disk medium in the rotation direction based on the pattern for position detection  
15 read by the read head device;

servo pattern write means for writing the servo pattern as a reference for one rotation in the position by the write head device based on a detected result from the detection means, when the head is moved to  
20 an innermost peripheral position or an outermost peripheral position on the disk medium, so that the servo pattern is additionally recorded every rotation successively in the outer or inner peripheral direction from the servo pattern; and

25 head positioning control means for executing a positioning control of the head, when the servo pattern recorded on the disk medium is read by the read head

device, and the additional recording operation is performed based on the servo pattern.

2. The servo writing apparatus according to claim 1, wherein a clock pattern is recorded as  
5 the pattern for position detection in the rotation direction in the whole surface of the disk medium incorporated in the disk drive.

3. The servo writing apparatus according to claim 1, wherein the servo pattern write means writes  
10 the servo pattern in the whole surface of the disk medium.

4. The servo writing apparatus according to claim 1, wherein the disk drive includes an actuator mechanism on which the head is mounted and which moves  
15 the head in a radial direction on the disk medium, and the head positioning control means drives/controls the actuator mechanism to execute the head positioning control.

5. A disk drive comprising:  
20 a disk medium in which a pattern for position detection in a rotation direction is recorded;  
a head including a read head device and a write head device, and having a constitution in which a position relation between the read head device and  
25 the write head device relatively deviates in an inner or outer peripheral direction of the disk medium;  
an actuator mechanism on which the head is mounted

and which moves the head in a radial direction on the disk medium; and

5 a servo writer unit which includes an attachable/detachable structure and which records a servo pattern on the disk medium,

the servo writer unit including:

10 detection means for detecting the position of the head positioned on the disk medium in the rotation direction based on the pattern for position detection read by the read head device;

15 servo pattern write means for writing the servo pattern as a reference for one rotation in the position by the write head device based on a detected result from the detection means, when the head is moved to an innermost peripheral position or an outermost peripheral position on the disk medium, so that the servo pattern is additionally recorded every rotation successively in the outer or inner peripheral direction from the servo pattern; and

20 head positioning control means for driving/controlling the actuator mechanism to execute a positioning control of the head, when the servo pattern recorded on the disk medium is read by the read head device, and the additional recording operation is performed based on the servo pattern.

25 6. The disk drive according to claim 5, wherein a clock pattern is recorded as the pattern for position

detection in the rotation direction in one surface of the disk medium incorporated in the disk drive.

7. The disk drive according to claim 5, wherein the servo pattern write means writes the servo pattern  
5 in the whole surface of the disk medium.

8. The disk drive apparatus according to claim 5, further comprising:

a read/write channel which processes a signal of data read/written on the disk medium by the head,  
10 wherein the servo writer unit is incorporated in the read/write channel.

9. The disk drive according to claim 5, wherein after the servo pattern is recorded in the whole surface of the disk medium by the servo writer unit,  
15 the servo pattern and clock pattern other than a pattern left as a servo area are deleted by a write operation of the data by the write head device.

10. The disk drive according to claim 5, wherein the servo pattern and clock pattern other than a  
20 pattern left as a servo area are deleted from the disk medium, and the servo pattern remains as a reference recorded for one rotation along an innermost or outermost periphery in the disk medium.

11. A servo writing method which records servo  
25 patterns on a disk medium with respect to a disk storage apparatus including a head and the disk medium in which a pattern for position detection in a rotation

direction is recorded, the head including a read head device and write head device, the disk storage apparatus having a constitution in which a positional relation between the read head device and write head  
5 device relatively deviates in an inner or outer peripheral direction of the disk medium, the servo writing method comprising:

moving the head to an innermost peripheral position on the disk medium;

10 detecting the position of the head positioned on the disk medium in the rotation direction based on the pattern for position detection read by the read head device;

writing the servo pattern as a reference for one  
15 rotation in the position by the write head device based on a detected result by the detecting step, while the head is kept in an innermost peripheral position on the disk medium;

reading the servo pattern recorded on the disk  
20 medium by the read head device, and moving the head in the outer peripheral direction from the innermost peripheral position based on the servo pattern; and

adding the servo pattern every rotation successively in the outer peripheral direction with  
25 the movement of the write head device.

12. The method according to claim 11, further comprising:

moving the head to an outermost peripheral  
position on the disk medium at an initial time;

writing the servo pattern as a reference for one  
rotation in the position by the write head device based  
5 on a detected result by the detecting step, while the  
head is kept in an outermost peripheral position on the  
disk medium; and

reading the servo pattern recorded on the disk  
medium by the read head device, and moving the head  
10 in the inner peripheral direction from the outermost  
peripheral position based on the servo pattern.

13. The method according to claim 11, further  
comprising:

recording a clock pattern as the pattern for  
15 position detection in the rotation direction on one  
surface of the disk medium incorporated in the disk  
storage apparatus.

14. The method according to claim 11, further  
comprising:

20 writing the servo pattern in the whole surface  
of the disk medium so that the servo pattern is  
additionally recorded.